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        GERMINO, Gregory
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        PHAKDEEKITCHAROEN, Bunyong

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<151> 2001-07-13

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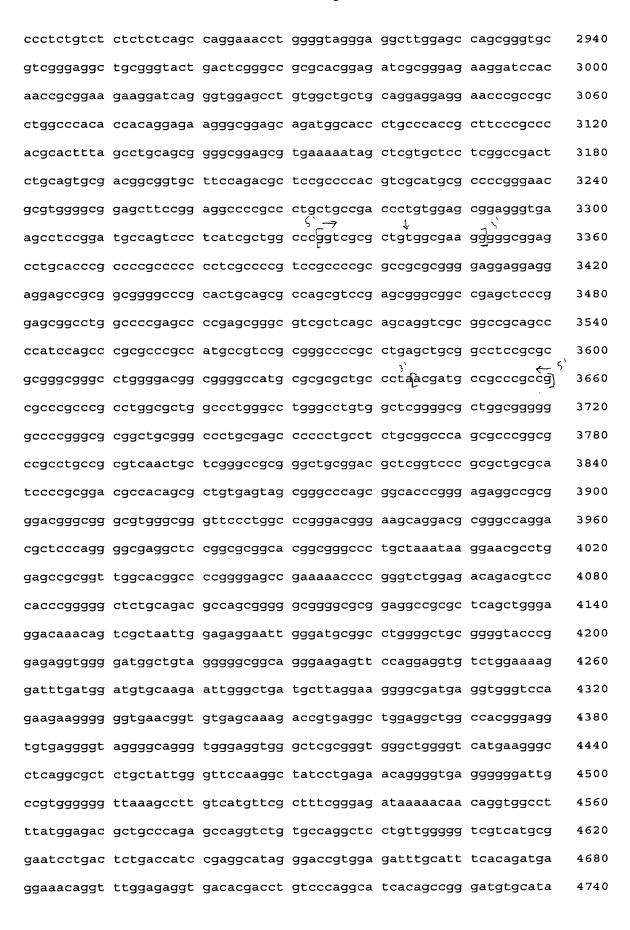<210> 1
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acaaggtcca ccccagcagc acttagtcct ccttcctggc gggggtgggc cgtggagtcg   51900

gagtggacac cgctcagtat tactttctgc cgctgtcaag gccgagggcc aggcagaatg   51960

gctgcacgta ggttccccag agagcaggca ggggcatctg tctgtctgtg ggcttcagca   52020

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ctgctggctt cagggagggt tagcctgcac cgccgccacc ctgcccctaa gttattacct   52260

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```

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agcccggctg ctgcttggat gcgagcttgg ccttgggccg gtgctggggg cacagctgtc    52500

tgccaggcac tctcatcacc ccagaggcct tgtcatcctc ccttgcccca ggccaggtag    52560

caagagagca gcgcccaggc ctgctggcat caggtctggg caagtagcag gactaggcat    52620

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gggcatggcc gcttctagag cctcgacacc cccccaaccc ccgcaccaag cagacaaagt    52860

caataaaaga gctgtctgac tgcaatctgt gcctctatgt ctgtgcactg gggtcaggac    52920

tttatttatt tcactgacag gcaataccgt ccaaggccag tgcaggaggg agggccccgg    52980

cctcacacaa actcggtgaa gtcctccacc gaggagatga ggcgcttccg ctggcccacc    53040

tcatagccag gtgtgggctc ggctggagtc tgtgcagggg ctttgctatg ggacggaggg    53100

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tggcacctgg gcctgtccca ccagctcacg cctggaccca cccccactca catttgcgtg    53460

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gg                                                                    53522
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<212>   PRT
<213>   Homo sapiens

<400>   2

Met Pro Pro Ala Ala Pro Ala Arg Leu Ala Leu Ala Leu Gly Leu Gly
1               5                   10                  15

Leu Trp Leu Gly Ala Leu Ala Gly Gly Pro Gly Arg Gly Cys Gly Pro
            20                  25                  30

Cys Glu Pro Pro Cys Leu Cys Gly Pro Ala Pro Gly Ala Ala Cys Arg
        35                  40                  45

Val Asn Cys Ser Gly Arg Gly Leu Arg Thr Leu Gly Pro Ala Leu Arg
```

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           50                    55                    60

Ile Pro Ala Asp Ala Thr Glu Leu Asp Val Ser His Asn Leu Leu Arg
65                   70                   75                   80

Ala Leu Asp Val Gly Leu Leu Ala Asn Leu Ser Ala Leu Ala Glu Leu
                     85                   90                   95

Asp Ile Ser Asn Asn Lys Ile Ser Thr Leu Glu Glu Gly Ile Phe Ala
                 100                 105                 110

Asn Leu Phe Asn Leu Ser Glu Ile Asn Leu Ser Gly Asn Pro Phe Glu
             115                 120                 125

Cys Asp Cys Gly Leu Ala Trp Leu Pro Gln Trp Ala Glu Glu Gln Gln
         130                 135                 140

Val Arg Val Val Gln Pro Glu Ala Ala Thr Cys Ala Gly Pro Gly Ser
145                 150                 155                 160

Leu Ala Gly Gln Pro Leu Leu Gly Ile Pro Leu Leu Asp Ser Gly Cys
                 165                 170                 175

Gly Glu Glu Tyr Val Ala Cys Leu Pro Asp Asn Ser Ser Gly Thr Val
             180                 185                 190

Ala Ala Val Ser Phe Ser Ala Ala His Glu Gly Leu Leu Gln Pro Glu
         195                 200                 205

Ala Cys Ser Ala Phe Cys Phe Ser Thr Gly Gln Gly Leu Ala Ala Leu
         210                 215                 220

Ser Glu Gln Gly Trp Cys Leu Cys Gly Ala Ala Gln Pro Ser Ser Ala
225                 230                 235                 240

Ser Phe Ala Cys Leu Ser Leu Cys Ser Gly Pro Pro Ala Pro Pro Ala
             245                 250                 255

Pro Thr Cys Arg Gly Pro Thr Leu Leu Gln His Val Phe Pro Ala Ser
         260                 265                 270

Pro Gly Ala Thr Leu Val Gly Pro His Gly Pro Leu Ala Ser Gly Gln
         275                 280                 285

Leu Ala Ala Phe His Ile Ala Ala Pro Leu Pro Val Thr Asp Thr Arg
         290                 295                 300

Trp Asp Phe Gly Asp Gly Ser Ala Glu Val Asp Ala Ala Gly Pro Ala
305                 310                 315                 320

Ala Ser His Arg Tyr Val Leu Pro Gly Arg Tyr His Val Thr Ala Val
             325                 330                 335

Leu Ala Leu Gly Ala Gly Ser Ala Leu Leu Gly Thr Asp Val Gln Val
         340                 345                 350

Glu Ala Ala Pro Ala Ala Leu Glu Leu Val Cys Pro Ser Ser Val Gln
         355                 360                 365

Ser Asp Glu Ser Leu Asp Leu Ser Ile Gln Asn Arg Gly Gly Ser Gly
         370                 375                 380
```

```
Leu Glu Ala Ala Tyr Ser Ile Val Ala Leu Gly Glu Glu Pro Ala Arg
385             390             395                 400

Ala Val His Pro Leu Cys Pro Ser Asp Thr Glu Ile Phe Pro Gly Asn
            405             410             415

Gly His Cys Tyr Arg Leu Val Val Glu Lys Ala Ala Trp Leu Gln Ala
            420             425             430

Gln Glu Gln Cys Gln Ala Trp Ala Gly Ala Ala Leu Ala Met Val Asp
        435             440             445

Ser Pro Ala Val Gln Arg Phe Leu Val Ser Arg Val Thr Arg Ser Leu
    450             455             460

Asp Val Trp Ile Gly Phe Ser Thr Val Gln Gly Val Glu Val Gly Pro
465             470             475                 480

Ala Pro Gln Gly Glu Ala Phe Ser Leu Glu Ser Cys Gln Asn Trp Leu
            485             490             495

Pro Gly Glu Pro His Pro Ala Thr Ala Glu His Cys Val Arg Leu Gly
            500             505             510

Pro Thr Gly Trp Cys Asn Thr Asp Leu Cys Ser Ala Pro His Ser Tyr
            515             520             525

Val Cys Glu Leu Gln Pro Gly Gly Pro Val Gln Asp Ala Glu Asn Leu
    530             535             540

Leu Val Gly Ala Pro Ser Gly Asp Leu Gln Gly Pro Leu Thr Pro Leu
545             550             555                 560

Ala Gln Gln Asp Gly Leu Ser Ala Pro His Glu Pro Val Glu Val Met
            565             570             575

Val Phe Pro Gly Leu Arg Leu Ser Arg Glu Ala Phe Leu Thr Thr Ala
            580             585             590

Glu Phe Gly Thr Gln Glu Leu Arg Arg Pro Ala Gln Leu Arg Leu Gln
    595             600             605

Val Tyr Arg Leu Leu Ser Thr Ala Gly Thr Pro Glu Asn Gly Ser Glu
    610             615             620

Pro Glu Ser Arg Ser Pro Asp Asn Arg Thr Gln Leu Ala Pro Ala Cys
625             630             635                 640

Met Pro Gly Gly Arg Trp Cys Pro Gly Ala Asn Ile Cys Leu Pro Leu
            645             650             655

Asp Ala Ser Cys His Pro Gln Ala Cys Ala Asn Gly Cys Thr Ser Gly
            660             665             670

Pro Gly Leu Pro Gly Ala Pro Tyr Ala Leu Trp Arg Glu Phe Leu Phe
            675             680             685

Ser Val Pro Ala Gly Pro Pro Ala Gln Tyr Ser Val Thr Leu His Gly
    690             695             700
```

Gln Asp Val Leu Met Leu Pro Gly Asp Leu Val Gly Leu Gln His Asp
705   710   715   720

Ala Gly Pro Gly Ala Leu Leu His Cys Ser Pro Ala Pro Gly His Pro
                725   730   735

Gly Pro Arg Ala Pro Tyr Leu Ser Ala Asn Ala Ser Ser Trp Leu Pro
        740   745   750

His Leu Pro Ala Gln Leu Glu Gly Thr Trp Gly Cys Pro Ala Cys Ala
        755   760   765

Leu Arg Leu Leu Ala Gln Arg Glu Gln Leu Thr Val Leu Leu Gly Leu
    770   775   780

Arg Pro Asn Pro Gly Leu Arg Leu Pro Gly Arg Tyr Glu Val Arg Ala
785   790   795   800

Glu Val Gly Asn Gly Val Ser Arg His Asn Leu Ser Cys Ser Phe Asp
            805   810   815

Val Val Ser Pro Val Ala Gly Leu Arg Val Ile Tyr Pro Ala Pro Arg
            820   825   830

Asp Gly Arg Leu Tyr Val Pro Thr Asn Gly Ser Ala Leu Val Leu Gln
        835   840   845

Val Asp Ser Gly Ala Asn Ala Thr Ala Thr Ala Arg Trp Pro Gly Gly
    850   855   860

Ser Leu Ser Ala Arg Phe Glu Asn Val Cys Pro Ala Leu Val Ala Thr
865   870   875   880

Phe Val Pro Ala Cys Pro Trp Glu Thr Asn Asp Thr Leu Phe Ser Val
            885   890   895

Val Ala Leu Pro Trp Leu Ser Glu Gly Glu His Val Val Asp Val Val
            900   905   910

Val Glu Asn Ser Ala Ser Arg Ala Asn Leu Ser Leu Arg Val Thr Ala
        915   920   925

Glu Glu Pro Ile Cys Gly Leu Arg Ala Thr Pro Ser Pro Glu Ala Arg
    930   935   940

Val Leu Gln Gly Val Leu Val Arg Tyr Ser Pro Val Val Glu Ala Gly
945   950   955   960

Ser Asp Met Val Phe Arg Trp Thr Ile Asn Asp Lys Gln Ser Leu Thr
            965   970   975

Phe Gln Asn Val Val Phe Asn Val Ile Tyr Gln Ser Ala Ala Val Phe
            980   985   990

Lys Leu Ser Leu Thr Ala Ser Asn His Val Ser Asn Val Thr Val Asn
        995   1000   1005

Tyr Asn Val Thr Val Glu Arg Met Asn Arg Met Gln Gly Leu Gln
    1010   1015   1020

Val Ser Thr Val Pro Ala Val Leu Ser Pro Asn Ala Thr Leu Ala

```
            1025                      1030                      1035

   Leu Thr Ala Gly Val Leu Val Asp Ser Ala Val Glu Val Ala Phe
       1040                      1045                      1050

   Leu Trp Thr Phe Gly Asp Gly Glu Gln Ala Leu His Gln Phe Gln
       1055                      1060                      1065

   Pro Pro Tyr Asn Glu Ser Phe Pro Val Pro Asp Pro Ser Val Ala
       1070                      1075                      1080

   Gln Val Leu Val Glu His Asn Val Thr His Thr Tyr Ala Ala Pro
       1085                      1090                      1095

   Gly Glu Tyr Leu Leu Thr Val Leu Ala Ser Asn Ala Phe Glu Asn
       1100                      1105                      1110

   Leu Thr Gln Gln Val Pro Val Ser Val Arg Ala Ser Leu Pro Ser
       1115                      1120                      1125

   Val Ala Val Gly Val Ser Asp Gly Val Leu Val Ala Gly Arg Pro
       1130                      1135                      1140

   Val Thr Phe Tyr Pro His Pro Leu Pro Ser Pro Gly Gly Val Leu
       1145                      1150                      1155

   Tyr Thr Trp Asp Phe Gly Asp Gly Ser Pro Val Leu Thr Gln Ser
       1160                      1165                      1170

   Gln Pro Ala Ala Asn His Thr Tyr Ala Ser Arg Gly Thr Tyr His
       1175                      1180                      1185

   Val Arg Leu Glu Val Asn Asn Thr Val Ser Gly Ala Ala Ala Gln
       1190                      1195                      1200

   Ala Asp Val Arg Val Phe Glu Glu Leu Arg Gly Leu Ser Val Asp
       1205                      1210                      1215

   Met Ser Leu Ala Val Glu Gln Gly Ala Pro Val Val Val Ser Ala
       1220                      1225                      1230

   Ala Val Gln Thr Gly Asp Asn Ile Thr Trp Thr Phe Asp Met Gly
       1235                      1240                      1245

   Asp Gly Thr Val Leu Ser Gly Pro Glu Ala Thr Val Glu His Val
       1250                      1255                      1260

   Tyr Leu Arg Ala Gln Asn Cys Thr Val Thr Val Gly Ala Gly Ser
       1265                      1270                      1275

   Pro Ala Gly His Leu Ala Arg Ser Leu His Val Leu Val Phe Val
       1280                      1285                      1290

   Leu Glu Val Leu Arg Val Glu Pro Ala Ala Cys Ile Pro Thr Gln
       1295                      1300                      1305

   Pro Asp Ala Arg Leu Thr Ala Tyr Val Thr Gly Asn Pro Ala His
       1310                      1315                      1320

   Tyr Leu Phe Asp Trp Thr Phe Gly Asp Gly Ser Ser Asn Thr Thr
       1325                      1330                      1335
```

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Val Arg Gly Cys Pro Thr Val  Thr His Asn Phe Thr  Arg Ser Gly
    1340                1345                1350

Thr Phe Pro Leu Ala Leu Val  Leu Ser Ser Arg Val  Asn Arg Ala
    1355                1360                1365

His Tyr Phe Thr Ser Ile Cys  Val Glu Pro Glu Val  Gly Asn Val
    1370                1375                1380

Thr Leu Gln Pro Glu Arg Gln  Phe Val Gln Leu Gly  Asp Glu Ala
    1385                1390                1395

Trp Leu Val Ala Cys Ala Trp  Pro Pro Phe Pro Tyr  Arg Tyr Thr
    1400                1405                1410

Trp Asp Phe Gly Thr Glu Glu  Ala Ala Pro Thr Arg  Ala Arg Gly
    1415                1420                1425

Pro Glu Val Thr Phe Ile Tyr  Arg Asp Pro Gly Ser  Tyr Leu Val
    1430                1435                1440

Thr Val Thr Ala Ser Asn Asn  Ile Ser Ala Ala Asn  Asp Ser Ala
    1445                1450                1455

Leu Val Glu Val Gln Glu Pro  Val Leu Val Thr Ser  Ile Lys Val
    1460                1465                1470

Asn Gly Ser Leu Gly Leu Glu  Leu Gln Gln Pro Tyr  Leu Phe Ser
    1475                1480                1485

Ala Val Gly Arg Gly Arg Pro  Ala Ser Tyr Leu Trp  Asp Leu Gly
    1490                1495                1500

Asp Gly Gly Trp Leu Glu Gly  Pro Glu Val Thr His  Ala Tyr Asn
    1505                1510                1515

Ser Thr Gly Asp Phe Thr Val  Arg Val Ala Gly Trp  Asn Glu Val
    1520                1525                1530

Ser Arg Ser Glu Ala Trp Leu  Asn Val Thr Val Lys  Arg Arg Val
    1535                1540                1545

Arg Gly Leu Val Val Asn Ala  Ser Arg Thr Val Val  Pro Leu Asn
    1550                1555                1560

Gly Ser Val Ser Phe Ser Thr  Ser Leu Glu Ala Gly  Ser Asp Val
    1565                1570                1575

Arg Tyr Ser Trp Val Leu Cys  Asp Arg Cys Thr Pro  Ile Pro Gly
    1580                1585                1590

Gly Pro Thr Ile Ser Tyr Thr  Phe Arg Ser Val Gly  Thr Phe Asn
    1595                1600                1605

Ile Ile Val Thr Ala Glu Asn  Glu Val Gly Ser Ala  Gln Asp Ser
    1610                1615                1620

Ile Phe Val Tyr Val Leu Gln  Leu Ile Glu Gly Leu  Gln Val Val
    1625                1630                1635
```

```
Gly Gly Gly Arg Tyr Phe Pro  Thr Asn His Thr Val  Gln Leu Gln
    1640            1645              1650

Ala Val Val Arg Asp Gly Thr  Asn Val Ser Tyr Ser  Trp Thr Ala
    1655            1660              1665

Trp Arg Asp Arg Gly Pro Ala  Leu Ala Gly Ser Gly  Lys Gly Phe
    1670            1675              1680

Ser Leu Thr Val Leu Glu Ala  Gly Thr Tyr His Val  Gln Leu Arg
    1685            1690              1695

Ala Thr Asn Met Leu Gly Ser  Ala Trp Ala Asp Cys  Thr Met Asp
    1700            1705              1710

Phe Val Glu Pro Val Gly Trp  Leu Met Val Ala Ala  Ser Pro Asn
    1715            1720              1725

Pro Ala Ala Val Asn Thr Ser  Val Thr Leu Ser Ala  Glu Leu Ala
    1730            1735              1740

Gly Gly Ser Gly Val Val Tyr  Thr Trp Ser Leu Glu  Glu Gly Leu
    1745            1750              1755

Ser Trp Glu Thr Ser Glu Pro  Phe Thr Thr His Ser  Phe Pro Thr
    1760            1765              1770

Pro Gly Leu His Leu Val Thr  Met Thr Ala Gly Asn  Pro Leu Gly
    1775            1780              1785

Ser Ala Asn Ala Thr Val Glu  Val Asp Val Gln Val  Pro Val Ser
    1790            1795              1800

Gly Leu Ser Ile Arg Ala Ser  Glu Pro Gly Gly Ser  Phe Val Ala
    1805            1810              1815

Ala Gly Ser Ser Val Pro Phe  Trp Gly Gln Leu Ala  Thr Gly Thr
    1820            1825              1830

Asn Val Ser Trp Cys Trp Ala  Val Pro Gly Gly Ser  Ser Lys Arg
    1835            1840              1845

Gly Pro His Val Thr Met Val  Phe Pro Asp Ala Gly  Thr Phe Ser
    1850            1855              1860

Ile Arg Leu Asn Ala Ser Asn  Ala Val Ser Trp Val  Ser Ala Thr
    1865            1870              1875

Tyr Asn Leu Thr Ala Glu Glu  Pro Ile Val Gly Leu  Val Leu Trp
    1880            1885              1890

Ala Ser Ser Lys Val Val Ala  Pro Gly Gln Leu Val  His Phe Gln
    1895            1900              1905

Ile Leu Leu Ala Ala Gly Ser  Ala Val Thr Phe Arg  Leu Gln Val
    1910            1915              1920

Gly Gly Ala Asn Pro Glu Val  Leu Pro Gly Pro Arg  Phe Ser His
    1925            1930              1935

Ser Phe Pro Arg Val Gly Asp  His Val Val Ser Val  Arg Gly Lys
```

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           1940                    1945                    1950

   Asn His Val Ser Trp Ala Gln  Ala Gln Val Arg Ile  Val Val Leu
       1955                    1960                    1965

   Glu Ala Val Ser Gly Leu Gln  Val Pro Asn Cys Cys  Glu Pro Gly
       1970                    1975                    1980

   Ile Ala Thr Gly Thr Glu Arg  Asn Phe Thr Ala Arg  Val Gln Arg
       1985                    1990                    1995

   Gly Ser Arg Val Ala Tyr Ala  Trp Tyr Phe Ser Leu  Gln Lys Val
       2000                    2005                    2010

   Gln Gly Asp Ser Leu Val Ile  Leu Ser Gly Arg Asp  Val Thr Tyr
       2015                    2020                    2025

   Thr Pro Val Ala Ala Gly Leu  Leu Glu Ile Gln Val  Arg Ala Phe
       2030                    2035                    2040

   Asn Ala Leu Gly Ser Glu Asn  Arg Thr Leu Val Leu  Glu Val Gln
       2045                    2050                    2055

   Asp Ala Val Gln Tyr Val Ala  Leu Gln Ser Gly Pro  Cys Phe Thr
       2060                    2065                    2070

   Asn Arg Ser Ala Gln Phe Glu  Ala Ala Thr Ser Pro  Ser Pro Arg
       2075                    2080                    2085

   Arg Val Ala Tyr His Trp Asp  Phe Gly Asp Gly Ser  Pro Gly Gln
       2090                    2095                    2100

   Asp Thr Asp Glu Pro Arg Ala  Glu His Ser Tyr Leu  Arg Pro Gly
       2105                    2110                    2115

   Asp Tyr Arg Val Gln Val Asn  Ala Ser Asn Leu Val  Ser Phe Phe
       2120                    2125                    2130

   Val Ala Gln Ala Thr Val Thr  Val Gln Val Leu Ala  Cys Arg Glu
       2135                    2140                    2145

   Pro Glu Val Asp Val Val Leu  Pro Leu Gln Val Leu  Met Arg Arg
       2150                    2155                    2160

   Ser Gln Arg Asn Tyr Leu Glu  Ala His Val Asp Leu  Arg Asp Cys
       2165                    2170                    2175

   Val Thr Tyr Gln Thr Glu Tyr  Arg Trp Glu Val Tyr  Arg Thr Ala
       2180                    2185                    2190

   Ser Cys Gln Arg Pro Gly Arg  Pro Ala Arg Val Ala  Leu Pro Gly
       2195                    2200                    2205

   Val Asp Val Ser Arg Pro Arg  Leu Val Leu Pro Arg  Leu Ala Leu
       2210                    2215                    2220

   Pro Val Gly His Tyr Cys Phe  Val Phe Val Val Ser  Phe Gly Asp
       2225                    2230                    2235

   Thr Pro Leu Thr Gln Ser Ile  Gln Ala Asn Val Thr  Val Ala Pro
       2240                    2245                    2250
```

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Glu Arg  Leu Val Pro Ile Ile  Glu Gly Gly Ser Tyr  Arg Val Trp
    2255             2260             2265

Ser Asp  Thr Arg Asp Leu Val  Leu Asp Gly Ser Glu  Ser Tyr Asp
    2270             2275             2280

Pro Asn  Leu Glu Asp Gly Asp  Gln Thr Pro Leu Ser  Phe His Trp
    2285             2290             2295

Ala Cys  Val Ala Ser Thr Gln  Arg Glu Ala Gly Gly  Cys Ala Leu
    2300             2305             2310

Asn Phe  Gly Pro Arg Gly Ser  Ser Thr Val Thr Ile  Pro Arg Glu
    2315             2320             2325

Arg Leu  Ala Ala Gly Val Glu  Tyr Thr Phe Ser Leu  Thr Val Trp
    2330             2335             2340

Lys Ala  Gly Arg Lys Glu Glu  Ala Thr Asn Gln Thr  Val Leu Ile
    2345             2350             2355

Arg Ser  Gly Arg Val Pro Ile  Val Ser Leu Glu Cys  Val Ser Cys
    2360             2365             2370

Lys Ala  Gln Ala Val Tyr Glu  Val Ser Arg Ser Ser  Tyr Val Tyr
    2375             2380             2385

Leu Glu  Gly Arg Cys Leu Asn  Cys Ser Ser Gly Ser  Lys Arg Gly
    2390             2395             2400

Arg Trp  Ala Ala Arg Thr Phe  Ser Asn Lys Thr Leu  Val Leu Asp
    2405             2410             2415

Glu Thr  Thr Thr Ser Thr Gly  Ser Ala Gly Met Arg  Leu Val Leu
    2420             2425             2430

Arg Arg  Gly Val Leu Arg Asp  Gly Glu Gly Tyr Thr  Phe Thr Leu
    2435             2440             2445

Thr Val  Leu Gly Arg Ser Gly  Glu Glu Glu Gly Cys  Ala Ser Ile
    2450             2455             2460

Arg Leu  Ser Pro Asn Arg Pro  Pro Leu Gly Gly Ser  Cys Arg Leu
    2465             2470             2475

Phe Pro  Leu Gly Ala Val His  Ala Leu Thr Thr Lys  Val His Phe
    2480             2485             2490

Glu Cys  Thr Gly Trp His Asp  Ala Glu Asp Ala Gly  Ala Pro Leu
    2495             2500             2505

Val Tyr  Ala Leu Leu Leu Arg  Arg Cys Arg Gln Gly  His Cys Glu
    2510             2515             2520

Glu Phe  Cys Val Tyr Lys Gly  Ser Leu Ser Ser Tyr  Gly Ala Val
    2525             2530             2535

Leu Pro  Pro Gly Phe Arg Pro  His Phe Glu Val Gly  Leu Ala Val
    2540             2545             2550
```

```
Val Val  Gln Asp Gln Leu Gly  Ala Ala Val Val Ala  Leu Asn Arg
    2555             2560             2565

Ser Leu  Ala Ile Thr Leu Pro  Glu Pro Asn Gly Ser  Ala Thr Gly
    2570             2575             2580

Leu Thr  Val Trp Leu His Gly  Leu Thr Ala Ser Val  Leu Pro Gly
    2585             2590             2595

Leu Leu  Arg Gln Ala Asp Pro  Gln His Val Ile Glu  Tyr Ser Leu
    2600             2605             2610

Ala Leu  Val Thr Val Leu Asn  Glu Tyr Glu Arg Ala  Leu Asp Val
    2615             2620             2625

Ala Ala  Glu Pro Lys His Glu  Arg Gln His Arg Ala  Gln Ile Arg
    2630             2635             2640

Lys Asn  Ile Thr Glu Thr Leu  Val Ser Leu Arg Val  His Thr Val
    2645             2650             2655

Asp Asp  Ile Gln Gln Ile Ala  Ala Ala Leu Ala Gln  Cys Met Gly
    2660             2665             2670

Pro Ser  Arg Glu Leu Val Cys  Arg Ser Cys Leu Lys  Gln Thr Leu
    2675             2680             2685

His Lys  Leu Glu Ala Met Met  Leu Ile Leu Gln Ala  Glu Thr Thr
    2690             2695             2700

Ala Gly  Thr Val Thr Pro Thr  Ala Ile Gly Asp Ser  Ile Leu Asn
    2705             2710             2715

Ile Thr  Gly Asp Leu Ile His  Leu Ala Ser Ser Asp  Val Arg Ala
    2720             2725             2730

Pro Gln  Pro Ser Glu Leu Gly  Ala Glu Ser Pro Ser  Arg Met Val
    2735             2740             2745

Ala Ser  Gln Ala Tyr Asn Leu  Thr Ser Ala Leu Met  Arg Ile Leu
    2750             2755             2760

Met Arg  Ser Arg Val Leu Asn  Glu Glu Pro Leu Thr  Leu Ala Gly
    2765             2770             2775

Glu Glu  Ile Val Ala Gln Gly  Lys Arg Ser Asp Pro  Arg Ser Leu
    2780             2785             2790

Leu Cys  Tyr Gly Gly Ala Pro  Gly Pro Gly Cys His  Phe Ser Ile
    2795             2800             2805

Pro Glu  Ala Phe Ser Gly Ala  Leu Ala Asn Leu Ser  Asp Val Val
    2810             2815             2820

Gln Leu  Ile Phe Leu Val Asp  Ser Asn Pro Phe Pro  Phe Gly Tyr
    2825             2830             2835

Ile Ser  Asn Tyr Thr Val Ser  Thr Lys Val Ala Ser  Met Ala Phe
    2840             2845             2850

Gln Thr  Gln Ala Gly Ala Gln  Ile Pro Ile Glu Arg  Leu Ala Ser
```

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        2855                    2860                    2865

   Glu Arg Ala Ile Thr Val Lys  Val Pro Asn Asn Ser  Asp Trp Ala
       2870                2875                2880

   Ala Arg Gly His Arg Ser Ser  Ala Asn Ser Ala Asn  Ser Val Val
       2885                2890                2895

   Val Gln Pro Gln Ala Ser Val  Gly Ala Val Val Thr  Leu Asp Ser
       2900                2905                2910

   Ser Asn Pro Ala Ala Gly Leu  His Leu Gln Leu Asn  Tyr Thr Leu
       2915                2920                2925

   Leu Asp Gly His Tyr Leu Ser  Glu Glu Pro Glu Pro  Tyr Leu Ala
       2930                2935                2940

   Val Tyr Leu His Ser Glu Pro  Arg Pro Asn Glu His  Asn Cys Ser
       2945                2950                2955

   Ala Ser Arg Arg Ile Arg Pro  Glu Ser Leu Gln Gly  Ala Asp His
       2960                2965                2970

   Arg Pro Tyr Thr Phe Phe Ile  Ser Pro Gly Ser Arg  Asp Pro Ala
       2975                2980                2985

   Gly Ser Tyr His Leu Asn Leu  Ser Ser His Phe Arg  Trp Ser Ala
       2990                2995                3000

   Leu Gln Val Ser Val Gly Leu  Tyr Thr Ser Leu Cys  Gln Tyr Phe
       3005                3010                3015

   Ser Glu Glu Asp Met Val Trp  Arg Thr Glu Gly Leu  Leu Pro Leu
       3020                3025                3030

   Glu Glu Thr Ser Pro Arg Gln  Ala Val Cys Leu Thr  Arg His Leu
       3035                3040                3045

   Thr Ala Phe Gly Ala Ser Leu  Phe Val Pro Pro Ser  His Val Arg
       3050                3055                3060

   Phe Val Phe Pro Glu Pro Thr  Ala Asp Val Asn Tyr  Ile Val Met
       3065                3070                3075

   Leu Thr Cys Ala Val Cys Leu  Val Thr Tyr Met Val  Met Ala Ala
       3080                3085                3090

   Ile Leu His Lys Leu Asp Gln  Leu Asp Ala Ser Arg  Gly Arg Ala
       3095                3100                3105

   Ile Pro Phe Cys Gly Gln Arg  Gly Arg Phe Lys Tyr  Glu Ile Leu
       3110                3115                3120

   Val Lys Thr Gly Trp Gly Arg  Gly Ser Gly Thr Thr  Ala His Val
       3125                3130                3135

   Gly Ile Met Leu Tyr Gly Val  Asp Ser Arg Ser Gly  His Arg His
       3140                3145                3150

   Leu Asp Gly Asp Arg Ala Phe  His Arg Asn Ser Leu  Asp Ile Phe
       3155                3160                3165
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Arg Ile  Ala Thr Pro His Ser  Leu Gly Ser Val Trp  Lys Ile Arg
    3170             3175             3180

Val Trp  His Asp Asn Lys Gly  Leu Ser Pro Ala Trp  Phe Leu Gln
    3185             3190             3195

His Val  Ile Val Arg Asp Leu  Gln Thr Ala Arg Ser  Ala Phe Phe
    3200             3205             3210

Leu Val  Asn Asp Trp Leu Ser  Val Glu Thr Glu Ala  Asn Gly Gly
    3215             3220             3225

Leu Val  Glu Lys Glu Val Leu  Ala Ala Ser Asp Ala  Ala Leu Leu
    3230             3235             3240

Arg Phe  Arg Arg Leu Leu Val  Ala Glu Leu Gln Arg  Gly Phe Phe
    3245             3250             3255

Asp Lys  His Ile Trp Leu Ser  Ile Trp Asp Arg Pro  Pro Arg Ser
    3260             3265             3270

Arg Phe  Thr Arg Ile Gln Arg  Ala Thr Cys Cys Val  Leu Leu Ile
    3275             3280             3285

Cys Leu  Phe Leu Gly Ala Asn  Ala Val Trp Tyr Gly  Ala Val Gly
    3290             3295             3300

Asp Ser  Ala Tyr Ser Thr Gly  His Val Ser Arg Leu  Ser Pro Leu
    3305             3310             3315

Ser Val  Asp Thr Val Ala Val  Gly Leu Val Ser Ser  Val Val Val
    3320             3325             3330

Tyr Pro  Val Tyr Leu Ala Ile  Leu Phe Leu Phe Arg  Met Ser Arg
    3335             3340             3345

Ser Lys  Val Ala Gly Ser Pro  Ser Pro Thr Pro Ala  Gly Gln Gln
    3350             3355             3360

Val Leu  Asp Ile Asp Ser Cys  Leu Asp Ser Ser Val  Leu Asp Ser
    3365             3370             3375

Ser Phe  Leu Thr Phe Ser Gly  Leu His Ala Glu Gln  Ala Phe Val
    3380             3385             3390

Gly Gln  Met Lys Ser Asp Leu  Phe Leu Asp Asp Ser  Lys Ser Leu
    3395             3400             3405

Val Cys  Trp Pro Ser Gly Glu  Gly Thr Leu Ser Trp  Pro Asp Leu
    3410             3415             3420

Leu Ser  Asp Pro Ser Ile Val  Gly Ser Asn Leu Arg  Gln Leu Ala
    3425             3430             3435

Arg Gly  Gln Ala Gly His Gly  Leu Gly Pro Glu Glu  Asp Gly Phe
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Ser Leu  Ala Ser Pro Tyr Ser  Pro Ala Lys Ser Phe  Ser Ala Ser
    3455             3460             3465
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Asp Glu  Asp Leu Ile Gln Gln  Val Leu Ala Glu Gly  Val Ser Ser
    3470             3475             3480

Pro Ala  Pro Thr Gln Asp Thr  His Met Glu Thr Asp  Leu Leu Ser
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Ser Leu  Ser Ser Thr Pro Gly  Glu Lys Thr Glu Thr  Leu Ala Leu
    3500             3505             3510

Gln Arg  Leu Gly Glu Leu Gly  Pro Pro Ser Pro Gly  Leu Asn Trp
    3515             3520             3525

Glu Gln  Pro Gln Ala Ala Arg  Leu Ser Arg Thr Gly  Leu Val Glu
    3530             3535             3540

Gly Leu  Arg Lys Arg Leu Leu  Pro Ala Trp Cys Ala  Ser Leu Ala
    3545             3550             3555

His Gly  Leu Ser Leu Leu Leu  Val Ala Val Ala Val  Ala Val Ser
    3560             3565             3570

Gly Trp  Val Gly Ala Ser Phe  Pro Pro Gly Val Ser  Val Ala Trp
    3575             3580             3585

Leu Leu  Ser Ser Ser Ala Ser  Phe Leu Ala Ser Phe  Leu Gly Trp
    3590             3595             3600

Glu Pro  Leu Lys Val Leu Leu  Glu Ala Leu Tyr Phe  Ser Leu Val
    3605             3610             3615

Ala Lys  Arg Leu His Pro Asp  Glu Asp Asp Thr Leu  Val Glu Ser
    3620             3625             3630

Pro Ala  Val Thr Pro Val Ser  Ala Arg Val Pro Arg  Val Arg Pro
    3635             3640             3645

Pro His  Gly Phe Ala Leu Phe  Leu Ala Lys Glu Glu  Ala Arg Lys
    3650             3655             3660

Val Lys  Arg Leu His Gly Met  Leu Arg Ser Leu Leu  Val Tyr Met
    3665             3670             3675

Leu Phe  Leu Leu Val Thr Leu  Leu Ala Ser Tyr Gly  Asp Ala Ser
    3680             3685             3690

Cys His  Gly His Ala Tyr Arg  Leu Gln Ser Ala Ile  Lys Gln Glu
    3695             3700             3705

Leu His  Ser Arg Ala Phe Leu  Ala Ile Thr Arg Ser  Glu Glu Leu
    3710             3715             3720

Trp Pro  Trp Met Ala His Val  Leu Leu Pro Tyr Val  His Gly Asn
    3725             3730             3735

Gln Ser  Ser Pro Glu Leu Gly  Pro Pro Arg Leu Arg  Gln Val Arg
    3740             3745             3750

Leu Gln  Glu Ala Leu Tyr Pro  Asp Pro Pro Gly Pro  Arg Val His
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Thr Cys  Ser Ala Ala Gly Gly  Phe Ser Thr Ser Asp  Tyr Asp Val
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        3770                      3775                      3780

Gly Trp Glu Ser Pro His Asn  Gly Ser Gly Thr Trp  Ala Tyr Ser
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Ala Pro Asp Leu Leu Gly Ala  Trp Ser Trp Gly Ser  Cys Ala Val
    3800                      3805                      3810

Tyr Asp Ser Gly Gly Tyr Val  Gln Glu Leu Gly Leu  Ser Leu Glu
    3815                      3820                      3825

Glu Ser Arg Asp Arg Leu Arg  Phe Leu Gln Leu His  Asn Trp Leu
    3830                      3835                      3840

Asp Asn Arg Ser Arg Ala Val  Phe Leu Glu Leu Thr  Arg Tyr Ser
    3845                      3850                      3855

Pro Ala Val Gly Leu His Ala  Ala Val Thr Leu Arg  Leu Glu Phe
    3860                      3865                      3870

Pro Ala Ala Gly Arg Ala Leu  Ala Ala Leu Ser Val  Arg Pro Phe
    3875                      3880                      3885

Ala Leu Arg Arg Leu Ser Ala  Gly Leu Ser Leu Pro  Leu Leu Thr
    3890                      3895                      3900

Ser Val Cys Leu Leu Leu Phe  Ala Val His Phe Ala  Val Ala Glu
    3905                      3910                      3915

Ala Arg Thr Trp His Arg Glu  Gly Arg Trp Arg Val  Leu Arg Leu
    3920                      3925                      3930

Gly Ala Trp Ala Arg Trp Leu  Leu Val Ala Leu Thr  Ala Ala Thr
    3935                      3940                      3945

Ala Leu Val Arg Leu Ala Gln  Leu Gly Ala Ala Asp  Arg Gln Trp
    3950                      3955                      3960

Thr Arg Phe Val Arg Gly Arg  Pro Arg Arg Phe Thr  Ser Phe Asp
    3965                      3970                      3975

Gln Val Ala His Val Ser Ser  Ala Ala Arg Gly Leu  Ala Ala Ser
    3980                      3985                      3990

Leu Leu Phe Leu Leu Leu Val  Lys Ala Ala Gln His  Val Arg Phe
    3995                      4000                      4005

Val Arg Gln Trp Ser Val Phe  Gly Lys Thr Leu Cys  Arg Ala Leu
    4010                      4015                      4020

Pro Glu Leu Leu Gly Val Thr  Leu Gly Leu Val Val  Leu Gly Val
    4025                      4030                      4035

Ala Tyr Ala Gln Leu Ala Ile  Leu Leu Val Ser Ser  Cys Val Asp
    4040                      4045                      4050

Ser Leu Trp Ser Val Ala Gln  Ala Leu Leu Val Leu  Cys Pro Gly
    4055                      4060                      4065

Thr Gly Leu Ser Thr Leu Cys  Pro Ala Glu Ser Trp  His Leu Ser
    4070                      4075                      4080
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Pro Leu Leu Cys Val Gly Leu Trp Ala Leu Arg Leu Trp Gly Ala
    4085   4090   4095

Leu Arg Leu Gly Ala Val Ile Leu Arg Trp Arg Tyr His Ala Leu
    4100   4105   4110

Arg Gly Glu Leu Tyr Arg Pro Ala Trp Glu Pro Gln Asp Tyr Glu
    4115   4120   4125

Met Val Glu Leu Phe Leu Arg Arg Leu Arg Leu Trp Met Gly Leu
    4130   4135   4140

Ser Lys Val Lys Glu Phe Arg His Lys Val Arg Phe Glu Gly Met
    4145   4150   4155

Glu Pro Leu Pro Ser Arg Ser Ser Arg Gly Ser Lys Val Ser Pro
    4160   4165   4170

Asp Val Pro Pro Pro Ser Ala Gly Ser Asp Ala Ser His Pro Ser
    4175   4180   4185

Thr Ser Ser Ser Gln Leu Asp Gly Leu Ser Val Ser Leu Gly Arg
    4190   4195   4200

Leu Gly Thr Arg Cys Glu Pro Glu Pro Ser Arg Leu Gln Ala Val
    4205   4210   4215

Phe Glu Ala Leu Leu Thr Gln Phe Asp Arg Leu Asn Gln Ala Thr
    4220   4225   4230

Glu Asp Val Tyr Gln Leu Glu Gln Gln Leu His Ser Leu Gln Gly
    4235   4240   4245

Arg Arg Ser Ser Arg Ala Pro Ala Gly Ser Ser Arg Gly Pro Ser
    4250   4255   4260

Pro Gly Leu Arg Pro Ala Leu Pro Ser Arg Leu Ala Arg Ala Ser
    4265   4270   4275

Arg Gly Val Asp Leu Ala Thr Gly Pro Ser Arg Thr Pro Leu Arg
    4280   4285   4290

Ala Lys Asn Lys Val His Pro Ser Ser Thr
    4295   4300

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agcgcaacta cttggaggcc c                                        21


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gcagggtgag caggtggggc catcctac                                 28


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ccccgtcctc cccgtccttt tgtc                                           24


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aagcgcaaaa gggctgcgtc g                                              21


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agggcagaag ggatattggg   20

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tgagccctgc ccagtgtct   19

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21

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21

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<210>  38
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<400>  38
cccctaacca cagccagcg                                                 19


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tctgttcgtc ctggtgtcct g                                              21
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<400>  44
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<400>   52
aggtcaacgt gggcctccaa gtagt                                               25


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ggttgtctat cccgtctacc tggccctcct                                30


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<400>   58

Trp Asp Phe Gly Asp Gly Ser
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<210>   59
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<400>   59

His Leu Thr Ala
1


<210>   60
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cccggttcac tcactgcg                                                    18


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<400>  69
acgtgatgtt gtcgcccg                                                18


<210>  70
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<210>   72
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<220>
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ctggaggtgc tgcgcgtt                                          18


<210>   73
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<210>   74
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<210>   75
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<210> 76
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<210> 77
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<220>
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ctacctgtgg gatctgggg   19

<210> 79
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